# DRAFT ENVIRONMENTAL RESTORATION RFCA STANDARD OPERATING PROTOCOL FOR ROUTINE SOIL REMEDIATION FY03 NOTIFICATION #03-03 IHSS 111.1, TRENCH 4



**November 2002**





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# ENVIRONMENTAL RESTORATION
# RFCA STANDARD OPERATING PROTOCOL
# FOR ROUTINE SOIL REMEDIATION
# FY03 NOTIFICATION #03-03
# IHSS 111.1, TRENCH 4

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## ACRONYMS

| | |
|---|---|
| AL | Action Level |
| AOC | area of concern |
| BZ | Buffer Zone |
| BZ SAP | Buffer Zone Sampling and Analysis Plan |
| COC | contaminant of concern |
| DOE | Department of Energy |
| ER | Environmental Restoration |
| ER RSOP | Environmental Restoration RSOP for Routine Soil Remediation |
| ft. | feet |
| FY | Fiscal Year |
| IA | Industrial Area |
| IHSS | Individual Hazardous Substance Site |
| IMP | Integrated Monitoring Program |
| PCOC | potential contaminant of concern |
| RFCA | Rocky Flats Cleanup Agreement |
| RFETS | Rocky Flats Environmental Technology Site |
| RSOP | RFCA Standard Operating Protocol |
| VOC | volatile organic compound |



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## 1.0 INTRODUCTION

This Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2002a) Fiscal Year (FY) 03 Notification includes the notification to remediate an Individual Hazardous Substance Site (IHSS) in the Rocky Flats Environmental Technology Site (RFETS) northeastern Buffer Zone (BZ) during FY03. The purpose of this Notification is to invoke the ER RSOP for the western 60 feet of IHSS 111.1, Trench T-4 to remove a portion of soil (commonly referred to as the "burrito"). Activities specified in the ER RSOP are not reiterated here; however deviations from the ER RSOP are noted where appropriate.

The location of IHSS 111.1, Trench T-4 is shown on Figure 1. A portion of the soil within the western 60 feet of Trench T-4 contains contaminant concentrations greater than RFCA Action Levels (ALs) and will be excavated in accordance with RFCA and the ER RSOP. The soil is contained within a geo-textile liner and only this portion of the trench will be removed.

## 2.0 IHSS 111.1, TRENCH T-4

Trench T-4 is located approximately 800 feet northeast of the inner east guard gate and approximately 200 feet north of the East Access Road. It is one of multiple trenches referred to as the East Trenches. Trench T-4 is approximately 125 feet long, approximately 20 feet wide, and approximately 10 feet deep. It was used primarily for the disposal of sanitary wastewater treatment plant sludge from approximately 1966 to 1967 along with miscellaneous debris (DOE 1992 and 1996).

Trench T-4 was a source removal in August 1996 to remove volatile organic compounds (VOCs) contributing to soil and groundwater contamination. The Trench T-4 excavation was approximately 148 feet long, 19 to 22 feet wide, and approximately 12 feet deep, except in one area where the excavation proceeded to bedrock at 26 feet. Approximately 2,090 cubic yards of contaminated soil and debris were removed, screened for radionuclides, and processed using thermal desorption technology to remove VOCs. Treatment verification sampling indicated that remaining VOC contamination was less than RFCA Tier II ALs. Of this amount, approximately 250 cubic yards of soil exceeded the RFCA Tier II ALs for radionuclides, but was less than RFCA Tier I ALs. The 250 cubic yards were segregated and placed into the western 60 feet of Trench T-4, as follows. A geotextile-grid liner was placed approximately eight feet below ground surface, the soil was placed on this, and a second layer of geotextile-grid liner was placed over the soil. Treated soil and topsoil approximately four feet deep were placed over this (DOE 1996). A cross-section of the western 60 feet of Trench T-4 showing the two-step process for filling the trench is shown on Figure 2.

### 2.1 Contaminants of Concern

Contaminants of concern (COCs) at IHSS 111.1, Trench T-4 were determined based on process knowledge and data collected during the previous investigation that included the source removal of Trench T-4 (DOE 1992 and 1996). A detailed location map of the western 60 feet of Trench T-4 is shown on Figure 3. Uranium-238 is the COC above RFCA Tier II ALs in the soil demarcated by the geotextile-grid liner located within the western 60 feet of Trench T-4.



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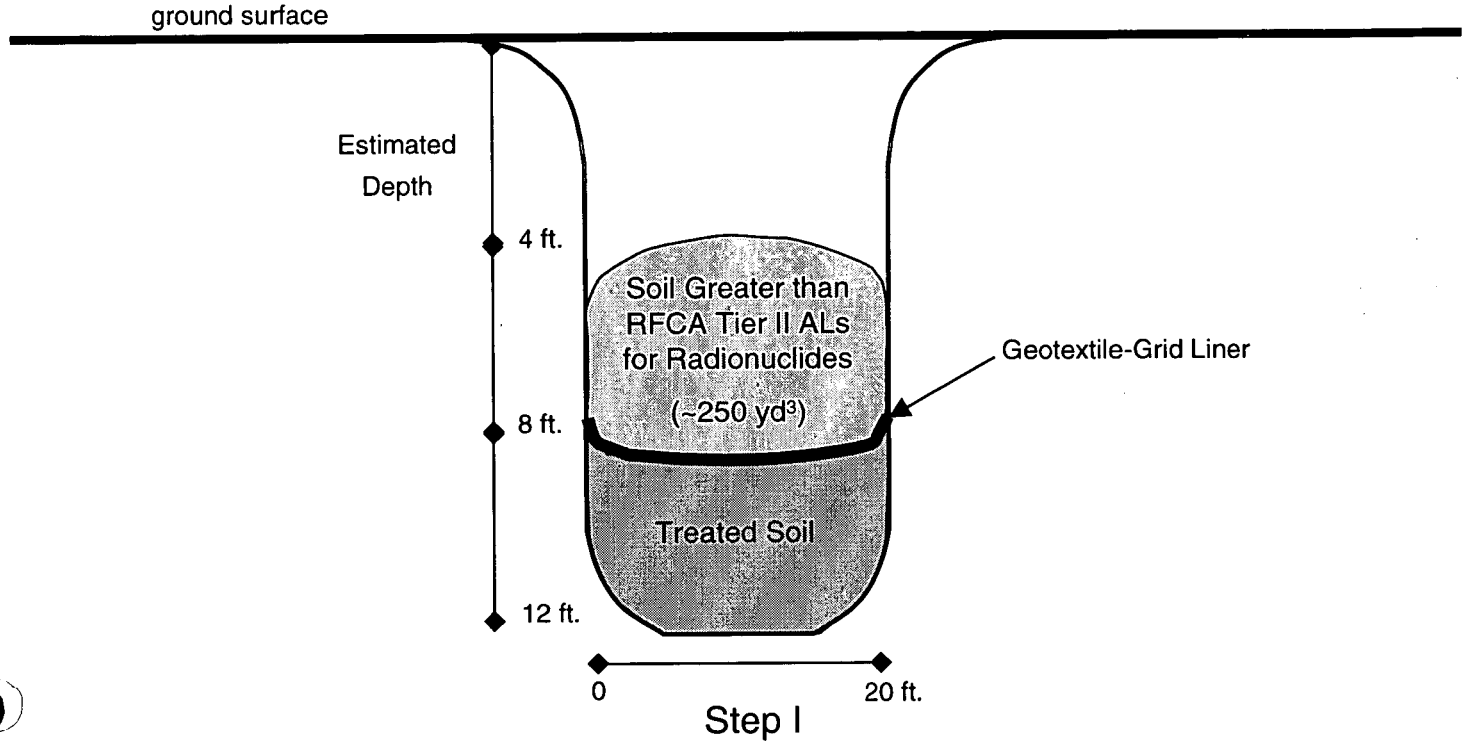
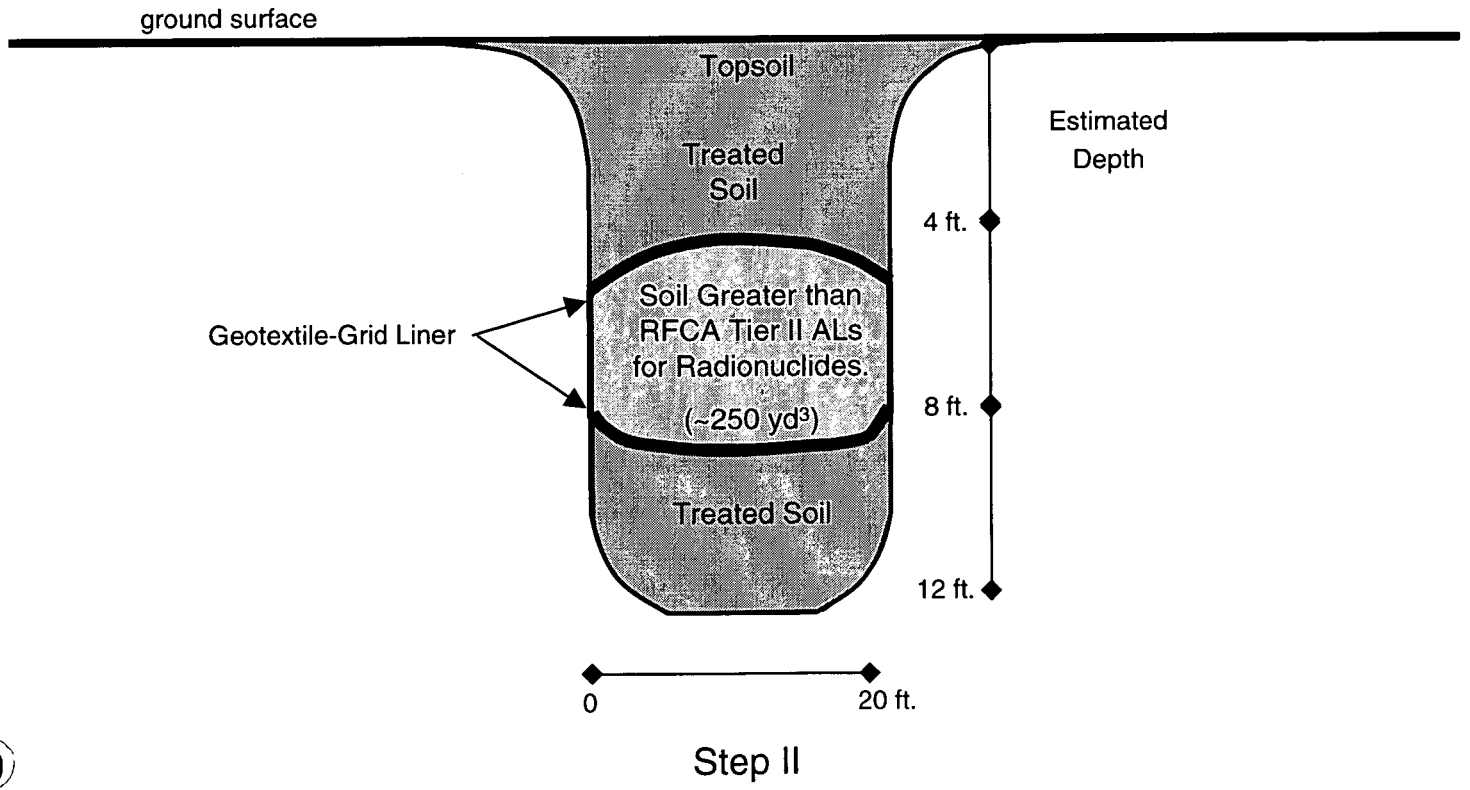
## Figure 2 - Cross-Section of the Western 60 Feet of Trench T-4



## 2.4 Stewardship Evaluation

Based on the COCs (Section 2.1) and the ER RSOP (DOE 2002a), it is anticipated that the 250 cubic yards demarcated by the geo-textile liner will be excavated. Figure 3 shows the potential excavation area. The following sections present the stewardship evaluation.

### 2.4.1 Proximity to Other Contaminant Sources

IHSS 111.1, Trench T-4 is part of the East Trenches that are located in the RFETS northeastern BZ on the north side of the East Access Road. The trench is surrounded by other trenches, including Trench T-10 (IHSS 111.7) to the south-southeast, Trench T-11 (IHSS 111.8) to the south-southwest, and Trench T-3 (IHSS 110) to the west. The soil in Trench T-3 was treated using thermal desorption technology at the same time as Trench T-4 and proposed for No Further Action (DOE 2000). Trenches T-10 and T-11 had few operational differences from Trenches T-3 and T-4 (DOE 1992).

### 2.4.2 Surface Water Protection

Surface water protection includes the following considerations:

***Is there a pathway to surface water from potential erosion to streams or drainages?***

Trench T-4 is in a relatively flat-lying area not prone to erosion. In addition, approximately four feet of treated soil and topsoil cover the waste material in the western 60 feet of Trench T-4. Surface runoff from the area flows into the Central Avenue Ditch and then into Pond B-5. Water from Pond B-5 is monitored prior to discharge.

***Do characterization data indicate there are contaminants in surface soil?***

Approximately four feet of treated soil and topsoil cover the waste material in the western 60 feet of Trench T-4. After removal of the waste material the area will be backfilled with clean soil and the existing cover material. It is anticipated that all potential contaminant concentrations in the subsurface will be less than background means plus two standard deviations in accordance with the ER RSOP (DOE 2002a).

***Do monitoring results from Points of Evaluation (POEs) or Points of Compliance (POCs) indicate there are surface water impacts from the area under consideration?***

The soil in Trench T-4 was treated for VOCs in 1996 using thermal desorption technology. VOC residual contaminant concentrations are below RFCA Tier II ALs and radionuclides residual contaminant concentrations above RFCA ALs are confined to the western 60 feet of Trench T-4. Furthermore, the POEs and POCs downstream of T-4 also monitor contaminants from the Central Avenue Ditch, which receives runoff from the eastern part of the Industrial Area (IA). Therefore, it is not possible to determine the exact source of the contaminants.

***Is the IHSS Group in an area with high erosion potential, based on the 100-Year Average Erosion Map?***

IHSS 111.1 is not located in an area with a high erosion potential. The 100-Year Average Erosion Map (Figure 11, DOE 2002a) indicates that IHSS 111.1 is located in an area designated as "No Disposition or Detachment".

### 2.4.3 Monitoring

Monitoring includes the following considerations:

***Do monitoring results from POEs or POCs indicate there are groundwater impacts from the area under consideration?***

The soil in Trench T-4 was treated for VOCs in 1996 using thermal desorption technology. The treated soil has no impact on the VOC concentrations in groundwater.

***Can the impact be traced to a specific IHSS Group?***

Impacts on groundwater quality could be from multiple sources, but not currently from IHSS 111.1, Trench T-4.

***Are additional monitoring stations needed?***

No. There are currently five monitoring wells (3687, 05691, 11891, 12191, and 12691) used to monitor the source removals in Trenches T-3 and T-4 (DOE 2001a).

***Can existing monitoring locations be deleted if additional remediation is conducted?***

No. Even though other trenches in the East Trenches area may not require remediation, monitoring will still be required to evaluate groundwater quality.

### 2.4.4 Stewardship Actions and Recommendations

Because the waste material will be removed from the trench, and the area will be backfilled with clean soil and the existing cover material all potential contaminant concentrations in the subsurface will be less than background means plus two standard deviations in accordance with the ER RSOP (DOE 2002a).

The current stewardship actions and recommendations for IHSS 111.1, Trench T-4 are as follows:

- Use Best Management Practices to reduce erosion into surface water drainage (Section 7.2 of the ER RSOP).
- Implement near-term institutional controls until final closure and stewardship decisions are implemented, including the following:
  - Signs and barriers;
  - Restrictions on soil excavation; and
  - Soil excavations controlled through the Site Soil Disturbance Permit process.
- Implement long-term stewardship actions, including the following:

- Continuing Federal ownership and control over the Site; and
- Land use restrictions in accordance with the Site's Long-Term Stewardship Plan.

These recommendations may change based on in-process remediation activities and other future RFETS remediation decisions.

## 2.5 Accelerated Action Remediation Goals

ER RSOP remedial action objectives include the following:

1. Provide a remedy consistent with the RFETS goal of protection of human health and the environment;

2. Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls; and

3. Minimize the spread of contaminants during implementation of accelerated actions.

The accelerated action remediation goals for IHSS 111.1, Trench T-4 include the following:

- Excavate soil from within geo-textile liner located within the western 60 feet of the trench and dispose of offsite;
- Conduct confirmation sampling if geo-textile liner is breached; and
- Reclaim the site to enable use as a wildlife refuge.

## 2.6 Treatment

Not applicable.

## 2.7 Project-Specific Monitoring

Environmental monitoring, including downstream surface water and downgradient groundwater monitoring, will be conducted as part of the Integrated Monitoring Program (IMP) to ensure that contaminant concentrations are not increasing and that water quality standards are being met (DOE 2001b).

Project-specific surface water, groundwater, and air monitoring during remediation will be planned through the IMP process. Additional air monitoring will be conducted in accordance with Work Controls in order to document the absence of airborne activity. Potential location of air monitor during removal activities is shown on Figure 4.

## 2.8 Intended Waste Disposition

It is anticipated that the soil excavated from Trench T-4 will be classified and disposed of as low level waste.

## 2.9 Administrative Record Documents

DOE, 1992, Historical Release Reports for the Rocky Flats Plant, Golden, Colorado, June.

DOE, 1996, Completion Report for the Source Removal at Trenches T-3 and T-4 (IHSS's 110 and 111.1), Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001a, Final 2000 Annual Rocky Flats Cleanup Agreement (RFCA) Groundwater Monitoring Report for the Rocky Flats Environmental Technology Site, November.

DOE, 2001b, Rocky Flats Environmental Technology Site, Integrated Monitoring Plan, Golden, Colorado.

DOE, 2002a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2002b, Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

## 2.10 Projected Schedule

Remediation of IHSS 111.1, Trench T-4 is expected to begin in the third or fourth quarter of FY03. This project is scheduled to be completed at the same time as the Trench T-7 project. The projected schedule to complete both projects is five months.

# 3.0 PUBLIC PARTICIPATION

ER RSOP Notification #03-03 activities will be discussed at the November 2002 ER/Decontamination and Decommissioning Status meeting. This Notification is available at the Rocky Flats Reading Rooms.

# 4.0 REFERENCES

DOE, 1992, Historical Release Reports for the Rocky Flats Plant, Golden, Colorado, June.

DOE, 1996, Completion Report for the Source Removal at Trenches T-3 and T-4 (IHSS's 110 and 111.1), Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1999, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.



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DOE, 2000, Annual Update for the Historical Release Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2001a, Final 2000 Annual Rocky Flats Cleanup Agreement (RFCA) Groundwater Monitoring Report for the Rocky Flats Environmental Technology Site, November.

DOE, 2001b, Rocky Flats Environmental Technology Site, Integrated Monitoring Plan, Golden, Colorado.

DOE, 2002a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2002b, Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.



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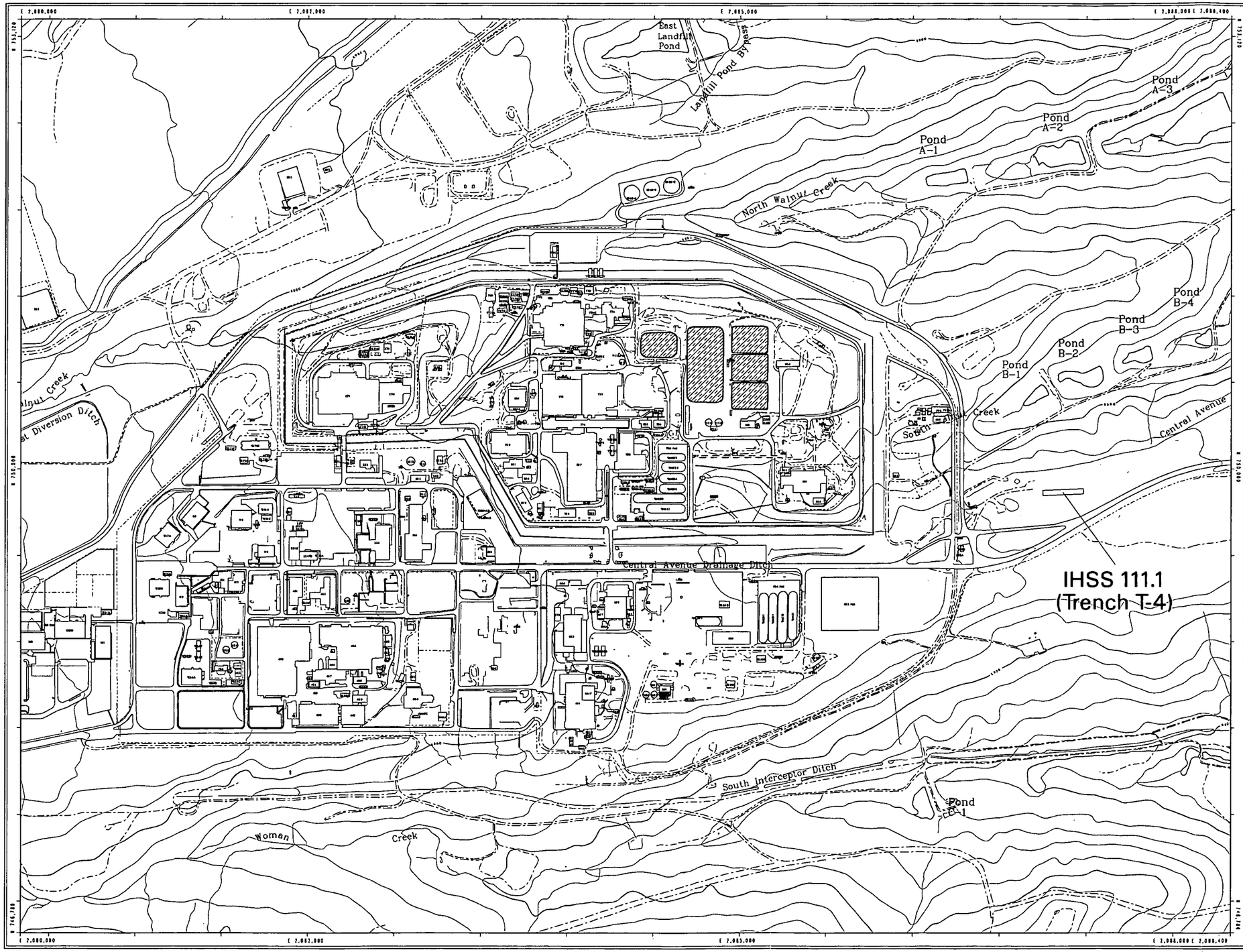
# Figure 1
# IHSS Location Map




## EXPLANATION

- IHSS

### Standard Map Features

- Buildings and other structures
- Solar Evaporation Ponds (SEPs)
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Topographic Contour (20-Foot)
- Rocky Flats Environmental Technology Site boundary
- Paved roads
- Dirt roads

*DATA SOURCE BASE FEATURES:*
*Buildings, fences, hydrographic, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs. VSS*

*Topographic contours were derived from digital elevation model (DEM) data by Mortenson Knudson (MK) using ESRI Arc TIN and LATTICE to process the DEM data to create 5-foot contours. The DEM data was captured by the Remote Sensing Lab, Las Vegas, NV, 1994 Aerial Flyover at ~ 10 meter resolution. DEM post-processing performed by MK, Winter 1997.*

N

Scale = 1 : 8180
1 inch represents approximately 682 feet

250 0 500 1000ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

DRAFT

October 29, 2002

NT_Svr w:/projects/fy2003/03-0019/N4_fig1.aml

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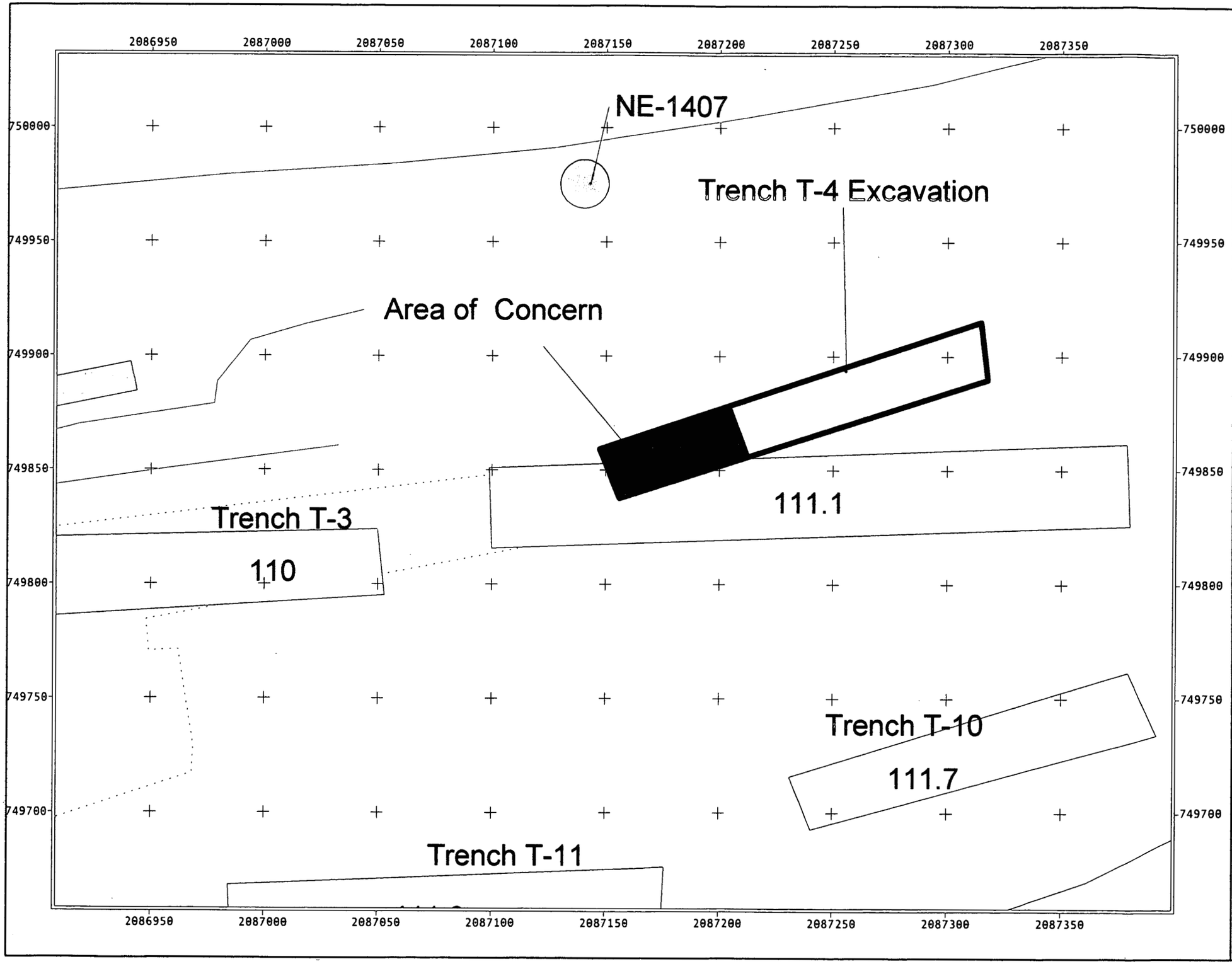
# Figure 3
# Location Map For
# IHSS 111.1,Trench T-4




KEY

- IHSS location
- PAC location
- Trench T-4
- Area of Concern
- Paved area
- Dirt road
- Stream, ditch, or other drainage feature



N W E S

20 0 20 40 60 Feet

Scale = 1:500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology S

Prepared by:

WATERSTONE
RADMS
REMEDIAL ACTION DECISION MANAGEMENT SYSTEM

KAISER•HILL COMPANY

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Date: 11/6/02

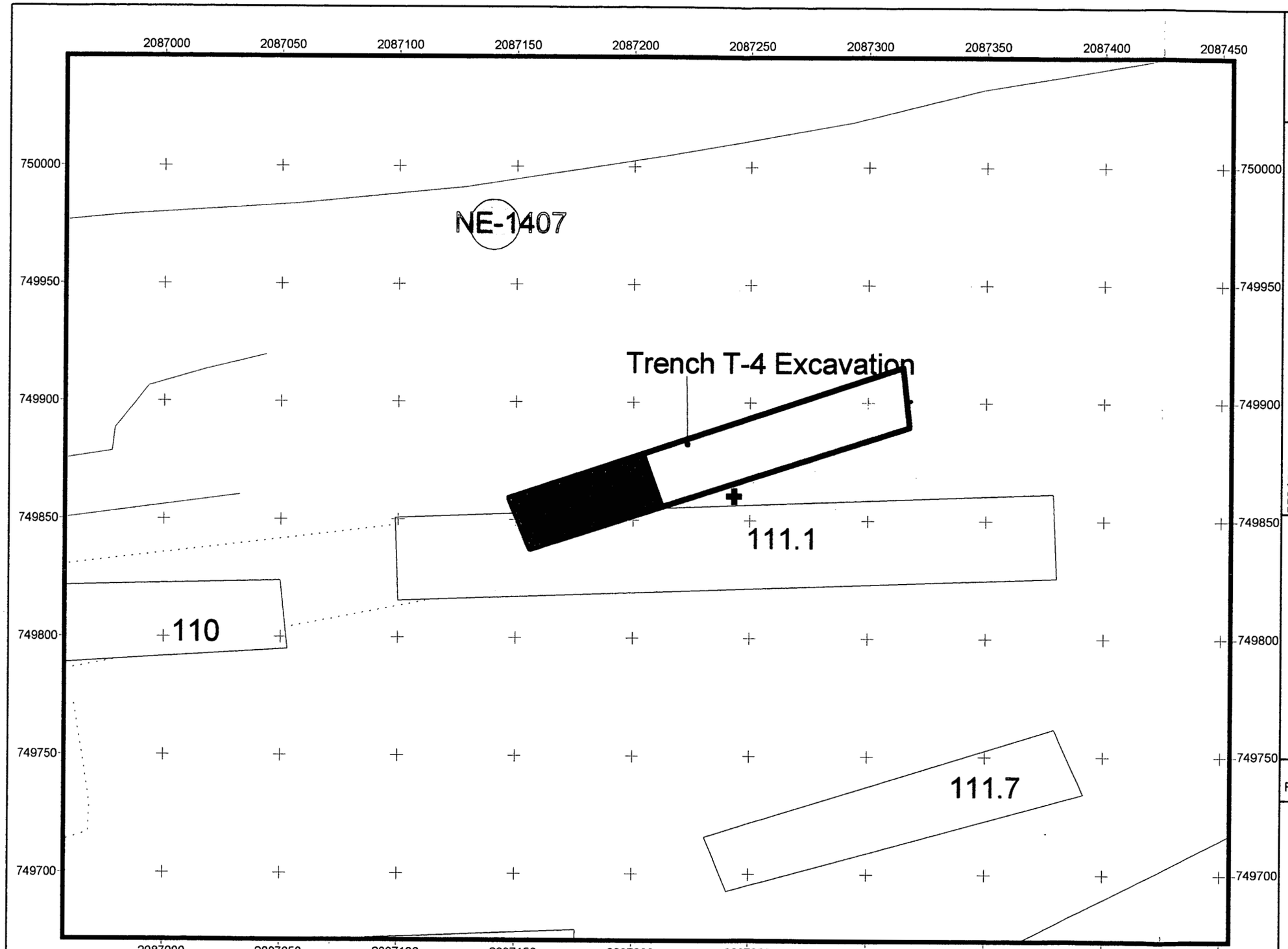


**Figure 4**
**Area of Concern for**
**IHSS 111.1, Trench T-4**

KEY

- IHSS location
- Trench T-4 Excavation
- Area of Concern
- Potential Air Monitoring Location



N
W E
S

10 0 10 20 30 40 50 60 Feet

Scale = 1:500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

RADMS

KAISER•HILL COMPANY

File: w:\Projects\fy2003\Trench T-4\T-4 Sample Location Map

Date: 11/6/2002

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